Remarks

Claims 73-126 were pending in the present application prior to the present Amendment. Claims 73, 74, 90, 105, and 126 have been amended, and claims 89 and 125 have been canceled herein. In addition, new claim 127 has been added. Claims 109-123 have been withdrawn from further consideration.

No new matter has been added to this application by the amendments made herein, with support being found in the specification, claims and figures as filed. Support for the amendments made to claims 73, 74, and 126 can be found, for example, on page 12 at lines 25-33, which discloses a metallic barrier layer of from 0.01 μm to 10 μm in thickness. Further support for these claims may be found on page 12, lines 13-16, which discloses a layer which is deposited in a seamless manner, as well as on page 33, lines 20-22, which states that such deposition avoids "using metal sheet for seam welding." Claim 74 finds additional support on page 18, lines 27-32 with regard to effective amounts of the recited filler.

In view of the foregoing, the Applicant respectfully requests entry of this Amendment and consideration of the present application as amended herein.

Double Patenting

Claims 74-75 and 85-87 were provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 31-35 and 37 of copending Application No. 11/458,927. The Applicant will address this ground of rejection once allowable claims have been found in that case or in the present application.

Rejections under 35 U.S.C. §101

Claim 125 was rejected under 35 U.S.C. §101 as failing to set forth a defined process. Claim 125 has been canceled herein, thereby rendering this rejection moot. In view of this, the Applicant respectfully requests that the rejection of claim 125 under 35 U.S.C. §101 be withdrawn.

Rejections under 35 U.S.C. §112, Second Paragraph

Claims 74, 95-107, and 125 were rejected under 35 U.S.C. §112, second paragraph as being indefinite. With regard to claim 74 and the claims dependent on it, the objection to the term "effective amount" in claim 74 has been addressed by deleting the term "effective" and by setting forth a standard for determining an amount of the recited filler. The term "substantially" has also been deleted from claim 105 in order to address the objection to this claim.

In addition, claim 125 has been canceled, making the rejection of this claim under 35 U.S.C. §112, second paragraph moot. In view of the foregoing, the Applicant respectfully requests that the rejections of claims 74, 95-107, and 125 under 35 U.S.C. §112, second paragraph be withdrawn.

Rejections under 35 U.S.C. § 102(b)

Claims 73, 75-77, 85-88, 108, and 124-126

Claims 73, 75-77, 85-88, 108, and 124-126 were rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent Publication No. 2002/0007861 to Hansen. The present invention provides a multilayer pipe with a plastic inner layer and a seamless metallic barrier layer having a thickness of from 0.01 μm to 10 μm. These features are present in all three of the pending independent claims, namely claims 73, 74 and 126. Claim 73 also specifies that the inner layer is a thermoplastic polymer of the inner layer, while claim 126 relates to a multilayer plastics pipe with an additional outer layer further characterized by the relative compressive moduli of the inner and outer plastics layers. It is respectfully submitted that the features related to the seamless nature and specified thickness of the metallic barrier layer, present in all independent claims, provide novelty over the prior art.

Hansen discloses a pipe which comprises an inner thermoplastic layer and an outer layer which comprises a metal sheath that is sheet welded. This is taught by Figure

3 and paragraphs 44 and 51 of Hansen. All of the teaching relating to the metallic layer provides for it to comprise a seam. Hansen does not mention the specific thickness of the metal layer, only stating that the ratio of the thickness of the metal layer relative to the total thickness of the entire pipe is less than in previous pipes (page 3 right hand column, lines 4 to 6). The skilled person would, however, understand that it is not practical to seam weld a metal layer of less than 0.2 mm, for instance because of difficulties in ensuring that the weld would be consistent and provide a seal along its entire length. It therefore follows that independent claim 73, which relates to a multilayer pipe with a seamless metallic barrier layer with thickness from 0.01 μm to 10 μm, is novel over Hansen. These novel features are also present in claims 74 and 126, which accordingly are also novel. It follows from this that the remaining claims which are dependent upon claim 73 or 74 are also novel in view of the Hansen reference.

In view of the foregoing, the Applicant respectfully requests that the rejection of claims 73, 75-77, 85-88, 108, and 124-126 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent Publication No. 2002/0007861 to Hansen be withdrawn.

Claims 73, 75, 91 and 92

Claims 73, 75, 91 and 92 were rejected under 35 U.S.C. §102(b) as being anticipated by European Patent No. 793 045 to Guest. Guest discloses a multilayer pipe with inner and outer plastics that incorporates a convoluted intermediate layer or "core" that can be metallic. Guest makes no mention of the specific thickness of this metallic layer, but teaches that the convoluted layer is designed to provide mechanical strength/stiffness, for example at column 2, lines 6 to 7 and 23 to 25. That the metal layer has sufficient thickness to provide mechanical strength is also reflected by disclosure that "the metal layer overcomes the plastics" memory "and allows the tube to be more readily formed to the required shape" at column 2, lines 10 to 12 and the requirement of claim 3 of Guest that the core takes a permanent set when bent. Thus, the convoluted layer of Guest, which can be metal or plastic, is required to be thick enough to provide mechanical strength to the resulting pipe and also provide sufficient stiffness to allow the tubing to retain a bent shape. In contrast, the metallic layer of the present

invention has a thickness of 0.01 μm to 10 μm, which would be too thin to provide the mechanical strength and stiffness required for the convoluted layer of Guest. Claim 73, and claims 75, 91 and 92 that are dependent upon it, are therefore novel in view of the Guest reference, and the Applicant respectfully requests that the rejection of these claims under 35 U.S.C. §102(b) in view of Guest be withdrawn.

The Applicant notes that a "Claussen" reference was mentioned in connection with this ground of rejection, without being identified. The Applicant presumes that the Guest reference was intended, but if this is not the case, it is respectfully requested that the intended reference be more specifically identified in order to give Applicant an opportunity to appropriately respond.

Rejections under 35 U.S.C. § 103

Claims 89 and 90

Claims 89 and 90 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent Publication No. 2002/0007861 to Hansen. Claim 89 has been cancelled herein, making this ground of rejection moot. Claim 90 recites a multilayer pipe having a metallic layer of from 0.05 μm to 5 μm in thickness. As stated above, Hansen discloses a metallic layer comprising a seam, and one of skill in the art would understand that it is not practical to seam weld a metal layer of less than 0.2 mm because of difficulties in ensuring that the weld would be consistent and provide a seal along its entire length. Welded material thinner than 0.2 mm generally contains imperfections that would result in breaks in the region of the weld seam, resulting in a layer that would allow leakage through the region of the weld and thus not function as a barrier layer. The skilled person would understand this, and therefore would not have looked to the Hansen reference as a starting point from which to reduce the thickness of a barrier layer to below 0.2 mm. Providing a seamless metallic barrier layer, for example using deposition techniques, with a thickness of between 0.05 μm and 5 μm in order to provide effective barrier properties around the entire circumference of a pipe, as recited in claim 90, is therefore nonobvious.

Moreover, the present multilayer pipe provides advantages relative to the prior art, including the following:

- less material is required;
- the final product is lighter, providing easier handling and transport; and
- when combined with the use of a contoured shape, it also is able to provide good bending properties.

In view of this, the Applicant respectfully submits that the Hansen reference does not render claim 90 obvious, and requests that the rejection of this claim under 35 U.S.C. § 103(a) be withdrawn.

Claims 74, 78-80, and 82-84

Claims 74, 78-80, and 82-84 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent Publication No. 2002/0007861 to Hansen in view of U.S. Patent Publication No. 2002/0082352 to Schmitz. The multilayer pipe recited in all of these claims includes a seamless metallic barrier layer of from 0.01 μm to 10 μm in thickness. As discussed above, the Hansen reference does not suggest such a barrier layer or its advantages, and therefore does not render claims 74, 78-80, and 82-84 obvious.

The Schmitz reference relates to a multilayer composite in which a polyamide layer is joined to a polyolefin layer by a bonding agent. This multilayer plastics material can be configured as a pipe. Schmitz, however, does not suggest the deposition of a seamless metallic barrier layer, and therefore does not supply the deficiency noted above with respect to the Hansen reference. In view of this, the Applicant respectfully submits that claims 74, 78-80, and 82-84 are patentable over the Hansen and Schmitz references, and requests that the rejection of these claims under 35 U.S.C. § 103(a) be withdrawn.

Claim 81

Claim 81 was rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent Publication No. 2002/0007861 to Hansen in view of U.S. Patent Publication No.

2002/0082352 to Schmitz and further in view of Japanese Patent No. 59155010 to Hibino. The Hibino reference, however, does not supply the deficiencies noted above with respect to the Hansen and Schmitz publications, and the combination of these references therefore does not render obvious the present multilayer pipe comprising a seamless metallic barrier layer of from 0.01 μm to 10 μm in thickness, as recited in claim 73. Claim 81 depends indirectly from claim 73, and therefore is patentable for this reason. The Applicant therefore respectfully requests that the rejection of claim 81 under 35 U.S.C. § 103(a) be withdrawn.

Claim 93

Claim 93 was rejected under 35 U.S.C. § 103(a) as being unpatentable over European Patent No. 793 045 to Guest in view of U.S. Patent No. 4305994 to Murase. Claim 93 was further rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent Publication No. 2002/0007861 to Hansen in view of U.S. Patent No. 4305994 to Murase.

The Murase patent relates to multilayer coating paints with pretreatment of substrate surfaces to be coated with an onium compound, where the onium compound comprises a sulphur, nitrogen, phosphorus or arsenic containing anion. Murase teaches that these coatings and treatments can be applied to the inside of, e.g., a steel pipe (column 10, lines 3 to 5). The skilled person would not be motivated to combine the teaching of Murase with either Guest or Hansen, as neither Guest nor Hansen provide a steel inner layer and both Guest and Hansen teach that the inner surface of the metal layer does not require pretreatment before association with the inner plastics layer. Accordingly, there is nothing in either Guest or Hansen that would encourage treatment or coating of the inner side of the metal layer with an onium compound. Hansen further describes that the metallic layer provides the necessary barrier layer, which works perfectly well according to Hansen, so there would be no motivation to apply the further barrier layer of Murase for this additional reason as well.

Even if Murause were combined with Guest or Hansen, the features of claim 93 would not be arrived at. Murase relates to a coating which can, for example, be applied

to a metal surface (column 3, lines 29 to 32 of Murase), not a compound that can be included within a polymeric layer that provides the inner layer of a pipe.

In view of the foregoing, the Applicant therefore respectfully requests that the rejection of claim 93 under 35 U.S.C. § 103(a) in view of Hansen, Guest, and Murase be withdrawn.

Claim 94

Claim 94 was rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent Publication No. 2002/0007861 to Hansen in view of U.S. Patent No. 5730922 to Babb. Babb discloses laminates comprising at least two layers, with one layer a polymer having perfluorocyclobutane rings (column 2, lines 18 to 20) and the other layer selected from a list of a number of different materials, including a metal. The skilled person would not seek to combine Babb with the teaching of Hansen and Schmitz, for example, because Hansen teaches that satisfactory pipes are formed without requiring surface modification of the metal layer, and thus provides no motivation to modify the surface of the metallic barrier layer. Babb also fails to supply the other deficiencies previously noted with respect to the Hansen reference. In view of this, the Applicant therefore respectfully requests that the rejection of claim 94 under 35 U.S.C. § 103(a) in view of Hansen and Babb be withdrawn.

Claims 95 and 96

Claims 95 and 96 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Patent Publication No. 2002/0007861 to Hansen in view of the Schmitz publication and U.S. Patent No. 5132344 to Matteodo. Claims 95 and 96 depend from claim 74, which recites a seamless metallic barrier layer of from 0.01 μm to 10 μm in thickness. The Matteodo reference does not supply the deficiencies noted above with respect to the Hansen and Schmitz references, which neither teach nor suggest such a barrier layer. In view of this, the Applicant respectfully submits that claims 92 and 96 are patentable over the Hansen, Schmitz, and Matteodo references, and the Applicant therefore respectfully

requests that the rejection of claims 95 and 96 under 35 U.S.C. § 103(a) in view of Hansen, Schmitz, and Matteodo be withdrawn.

Claims 97-100 and 102

Claims 97-100 and 102 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Patent Publication No. 2002/0007861 to Hansen in view of the Schmitz publication and U.S. Patent No. 5416142 to Bush. The Bush patent relates to adhesive bonding or welding of plastics layers (column 4, lines 40 to 41). The skilled person would consider that the teaching of Bush is not of relevance to pipes comprising a metal barrier layer, since bonding or welding involving metal is very different to plastics-to-plastics bonding/welding. The skilled person would therefore not seek to combine Bush with Hansen and Schmitz, with respect to pipes comprising a metal barrier layer. Moreover, the Bush reference does not supply the other deficiencies noted above with respect to the Hansen and Schmitz references. In view of the foregoing, the Applicant respectfully requests that the rejection of claims 97-100 and 102 under 35 U.S.C. § 103(a) in view of Hansen, Schmitz, and Bush be withdrawn.

Claim 101

Claim 101 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Patent Publication No. 2002/0007861 to Hansen in view of the Schmitz publication and U.S. Patent No. 4454258 to Kawahara. Kawahara relates to a resin forming material suitable for use in repairing bones and teeth. The skilled person would not seek to combine the teachings of Hansen and Schmitz with that of Kawahara in view of the fact that the Hansen and Schmitz references relate to pipes, which is a very different field than dentistry. Secondly, the physical properties of the material of Kawahara, which have to be hard and relatively inflexible to be compatible with the physical demands of teeth or bones, would be incompatible with the properties required of the pipes of Hansen, which are required to be bendable. Even if Kawahara were to be combined with Hansen and Schmitz, the skilled person would not arrive at the pipes of the present invention with

seamless metallic barrier layers of the thickness specified in the independent claims. In view of this, the Applicant respectfully requests that the rejection of claim 101 under 35 U.S.C. § 103(a) in view of Hansen, Schmitz, and Kawahara be withdrawn.

Claims 103-105

Claims 103-105 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Patent Publication No. 2002/0007861 to Hansen in view of the Schmitz publication and U.S. Patent No. 6465543 to Alexandre. The Alexandre patent is cited for its teaching in relation to nanofillers, in particular its disclosure concerning polyolefin nanocomposites. The skilled person would not seek to combine this with Hansen and Schmitz, for example because there is no indication that the materials of Alexandre would be useful in a pipe. In particular, there is no indication that they would be suitable for an inner layer that was associated with a barrier layer. Moreover, the Alexandre reference does not supply the deficiencies noted above with respect to the Hansen and Schmitz references. In view of the foregoing, the Applicant respectfully requests that the rejection of claims 103-105 under 35 U.S.C. § 103(a) in view of Hansen, Schmitz, and Alexandre be withdrawn.

Claims 106-107

Claims 106-107 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Patent Publication No. 2002/0007861 to Hansen in view of the Schmitz publication and U.S. Patent No. 3721597 to Colburn. Colburn is cited for its teaching in relation to adhesive layers with disclosure relating to metal lamina bonded with an adhesive thermoplastic material (column 2, lines 38 to 40). The skilled person would not seek to combine Hansen and Schmitz with Colburn, for example because the lamina of Colburn are not designed to be bent, and thus the skilled person would have no reason to believe that the adhesives of Colburn would work in the bendable pipes of Hansen. In addition, the Colburn reference does not supply the deficiencies noted above with respect to the Hansen and Schmitz references. In view of the foregoing, the Applicant respectfully

requests that the rejection of claims 106-107 under 35 U.S.C. § 103(a) in view of Hansen, Schmitz, and Colburn be withdrawn.

Conclusion

The Applicant believes that all pending claims presently under consideration, claims 73-88, 90-108, and 124, 126, and 127, are in condition for allowance. If, however, there remain any issues which can be addressed by telephone, the Examiner is encouraged to contact the undersigned at the telephone number listed below.

Please charge any additional fee due in connection with the present Amendment, or credit any overpayment, to Deposit Account No. 19-2090.

Respectfully submitted,

SHELDON MAK ROSE & ANDERSON

Date: May 29, 2009

By: /michael fedrick/
Michael Fedrick
Reg. No. 36,799

100 Corson Street, Third Floor
Pasadena, California 91103-3842
(626) 796-4000
Customer No. 23676